Energy Smart Management
POOL COVERS

OVERVIEW

Swimming pools are big energy consumers. Pool owner/operators spend billions of dollars annually to heat the nation's pools. Much of this energy is often wasted and can be saved with proper management. Wasting energy also contributes to our growing air quality problem.

RSPEC is a national program that asks you to consider measures to **R**educe **S**wimming **P**ool **E**nergy **C**osts.

HOW POOLS LOSE HEAT?

Pools lose energy in a variety of ways, but evaporation is by far the largest source of energy loss for swimming pools. When compared to evaporation, all other losses are small.

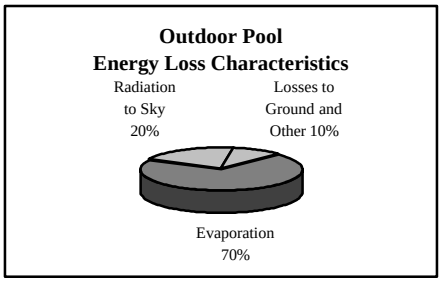
The reason evaporation has such an impact is that evaporating water requires tremendous amounts of energy. It only takes 1 Btu to raise 1 pound of water 1 degree, but each pound of 80° water that evaporates takes a whopping 1048 Btu's of heat out of the pool.

WHY POOL COVERS?

Since evaporation is the major source of heat loss for all swimming pools, to minimize evaporation one must cover the pool. Covering the pool with a pool cover when it is not in use is the single most effective means of reducing pool heating costs. **Savings of 50-70% are possible**.

OUTDOOR POOLS

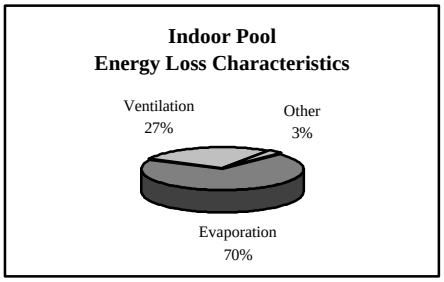
The diagram below illustrates the impact of evaporation on the total energy consumption of the outdoor pool.



The evaporation rate from an outdoor pool varies depending on the temperature of the pool, the temperature and humidity of the air, and the wind speed at the pool surface. The higher the pool temperature and wind speed and the lower the humidity, the greater the evaporation rate.

INDOOR POOLS

The next diagram illustrates the impact of evaporation on the total energy consumption of the indoor pool.



When we compare outdoor and indoor energy loss characteristics, energy loss vehicles may change, but the percentage for evaporation remains high.

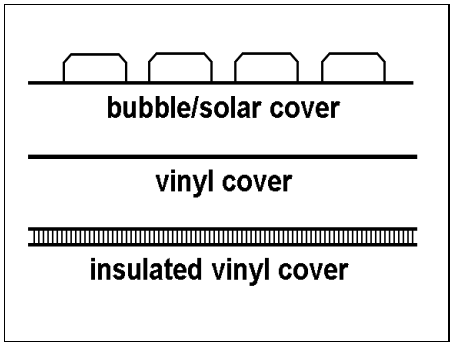
Indoor pools are not subject to the fluctuations in day and night temperatures of outdoor pools. Neither do they radiate heat to the night sky, or have winds that carry the heat away from the pool; but they do require room ventilation to control indoor humidity caused by the large amount of evaporation. Without a proper ventilation system, high indoor humidity levels will cause numerous problems, including condensation on cold surfaces and rusting of structural components. The energy required to run a ventilation system adds to the costs of operating an indoor pool. Also, the ventilated air must be conditioned, which adds further to the costs.

TYPES OF POOL COVERS

Technically, all you really need is a large sheet of plastic. Plastic meets the requirement of being a vapor barrier. But a large sheet of plastic that you get from the lumber store is probably not your best choice. It will be very difficult to handle and store, it tears easily, and sunlight will deteriorate it rapidly. You can use it, but it will be very inconvenient and will only last 1 to 2 seasons max.

There are a number of manufacturers that produce covers designed specifically for swimming pools. They can be made of different materials, such as UV stabilized polyethylene, polypropylene, or vinyl. They can be transparent or opaque. They can be light colored or dark colored.

One of the lowest cost covers made specifically for swimming pools is the bubble cover (some call them solar covers). They are similar to bubble packing material except that they use a thicker grade of plastic and have UV inhibitors, etc.



Vinyl covers are a heavier material and have a longer life expectancy. You can also get insulated vinyl covers with a thin layer of flexible insulation sandwiched between two layers of vinyl.

Outdoor pools gain heat from the sun, absorbing 75-85% of the solar energy striking the pool surface. This is an important contribution to the pool heating needs.

So when considering a pool cover, note that a pool cover will also decrease the solar gain contribution to the pool to

some extent, depending on the type of pool cover used. A transparent bubble cover may reduce pool solar energy absorption by 5-15%, and a completely opaque cover by 20-40%.

METHODS OF USE

There are several ways of covering your pool. The simplest and lowest first cost method is to manually pull the cover on and off, fold it, and place it somewhere out of the way. If you are paying someone to do this, you need to consider that cost in your economic evaluation. You can also purchase a pool cover reel that can be used to manually roll the pool cover up. The reel, usually on wheels, can then be rolled out of the way.

Semi-automatic covers use a motor driven reel system. They use electrical power to roll and unroll the cover, but usually require someone to pull on the cover when unrolling, or guide the cover onto the reel when rolling the cover up. They can be built into the pool deck surrounding the pool, or can use reels on carts.

Automatic covers have permanently mounted reels that automatically cover and uncover the pool at the push of a button. They are also the most expensive first cost option. But you have to weigh the cost of labor for the manual and semi-automatic covers to determine which route is best for your particular situation.

Some pool covers are fitted into tracks along the sides of the pool. This prevents anything or anybody from getting into the pool. They even support the weight of several people. If liability is a concern, these are a good option to explore. They can be run manually, semi-automatically, or automatically.

WHEN TO USE A POOL COVER

For pools which are open all day, a cover should be placed over the pool as soon as it closes, and taken off just before it opens for the day.

For pools which are not in use during daylight hours, the effectiveness of a pool cover will depend on whether the evaporation and other losses prevented by the cover exceed the solar gain reduction caused by the cover. This balance is affected by the type of cover and the climate. In dry and/or windy conditions the evaporation rate of the pool increases, and it is generally beneficial to have a transparent or bubble cover on during daylight hours. In warm, humid conditions the evaporation rate decreases, and it may be more beneficial to leave the cover off during the daytime.

OTHER BENEFITS

Pool covers also provide many other benefits beside the tremendous energy savings. They conserve water by reducing the amount of make-up water needed by 30-50%. They can reduce chemical consumption by 35-60%. They also cut cleaning time by keeping dirt and other debris out of the pool.

It is highly recommended that the first step to cutting pool energy loss be the evaluation of the economics of using a swimming pool cover.

(To clarify, we are not talking about pool covers that you use to cover the pool in the off season or mesh safety covers. Those do not save energy. We are talking about plastic or vinyl pool covers that you use during the swimming season when the pool is not in use.)

POOL ANALYSIS!

How much could YOU save by installing a high efficiency heat pump pool heater? Contact the organization who supplied you with this fact sheet (listed in the box below) to receive an energy analysis of your pool using the Department of Energy's *Energy Smart Pools* software. Or you can download a free copy of the software from the **RSPEC** Internet web site at: *http://www.eren.doe.gov/rspec*.

You will also find additional fact sheets and information on saving energy in pools at the **RSPEC** web site or by calling the Energy Efficiency and Renewable Energy Clearinghouse at 800-DOE-EREC.

TELL A FRIEND

If you know someone else who's interested in saving money on their pool operation, feel free to pass along a copy of this fact sheet to them. Reproduction and distribution of this piece or any of the **RSPEC** fact sheets or software is not restricted, but actually encouraged. **RSPEC** can make a difference!

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